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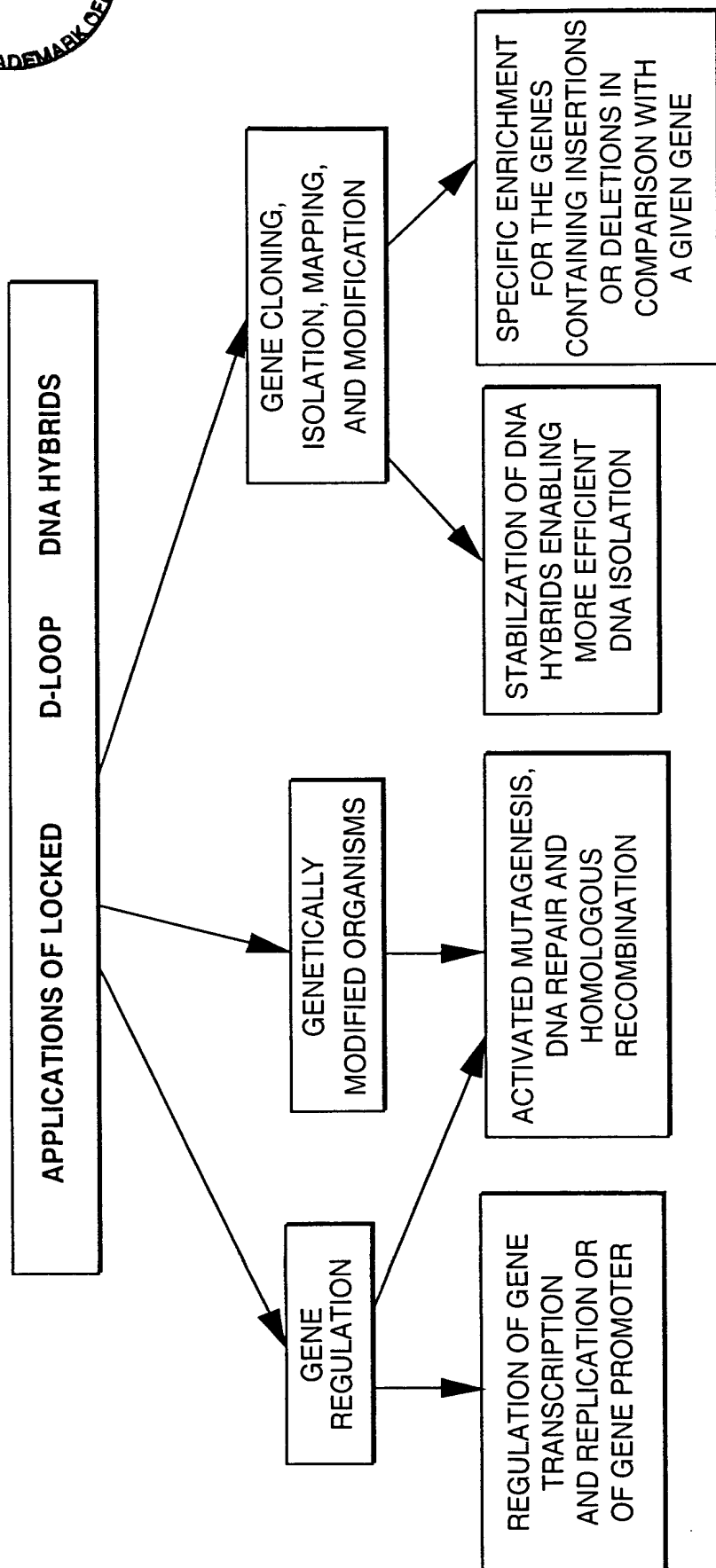
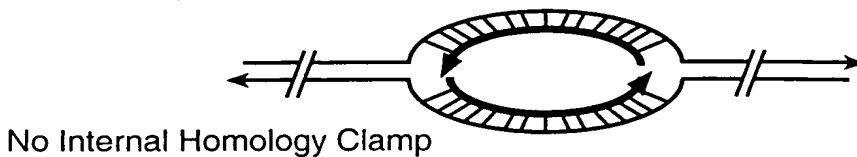


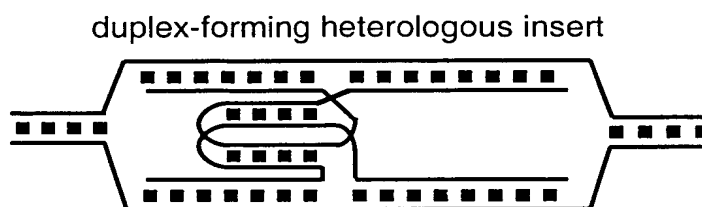
FIG.-1

Target DNA completely homologous

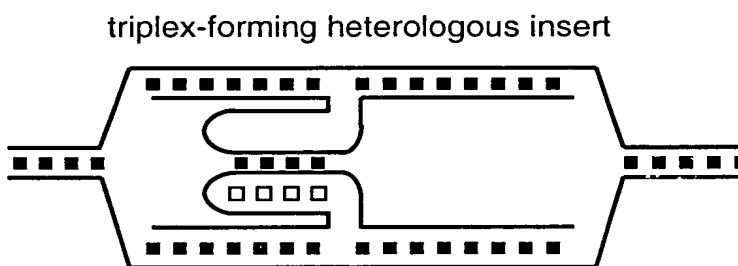
**FIG.\_2A**



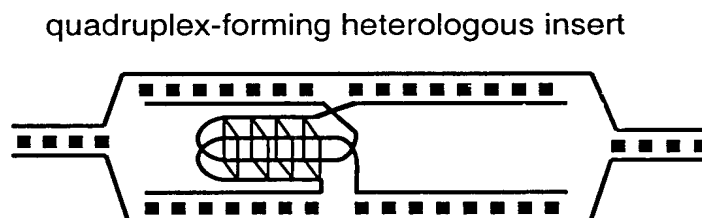
**FIG.\_2B**



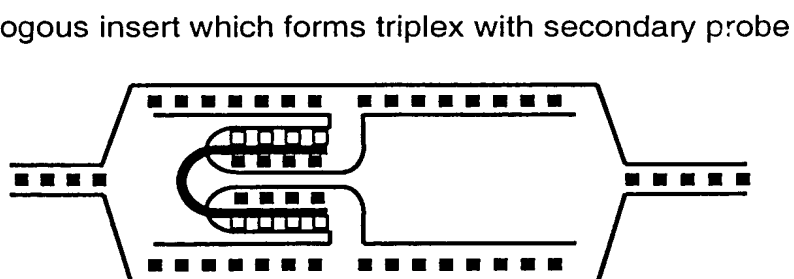
**FIG.\_2C**



**FIG.\_2D**

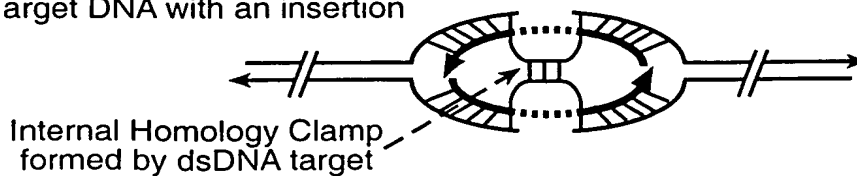


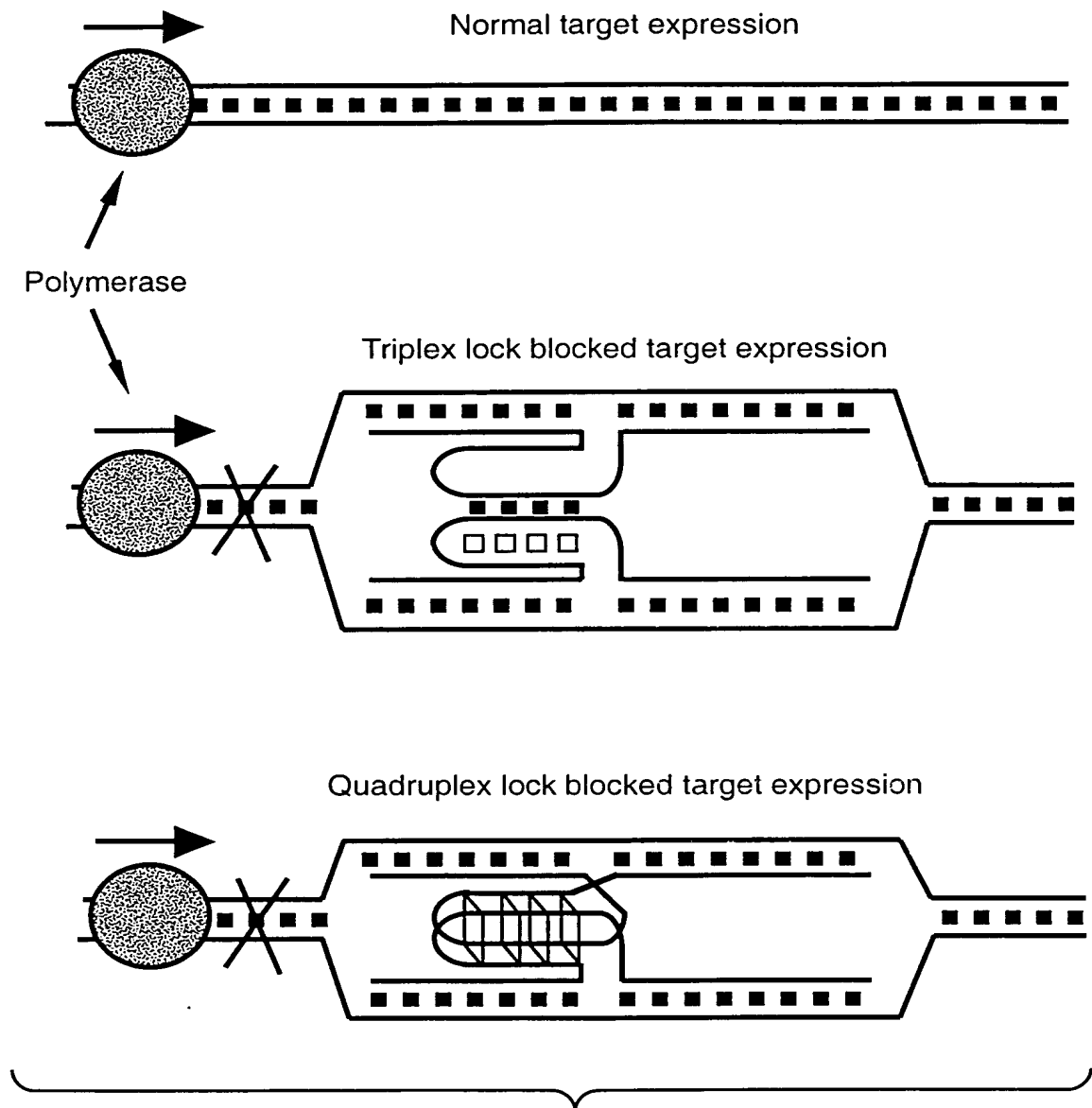
**FIG.\_2E**



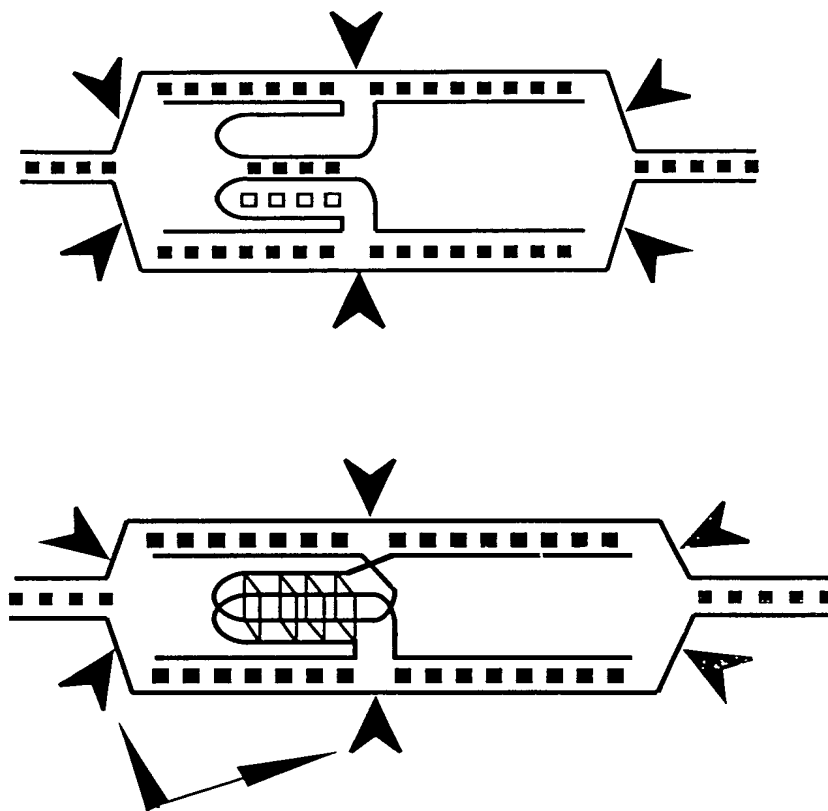
**FIG.\_2F**

Target DNA with an insertion



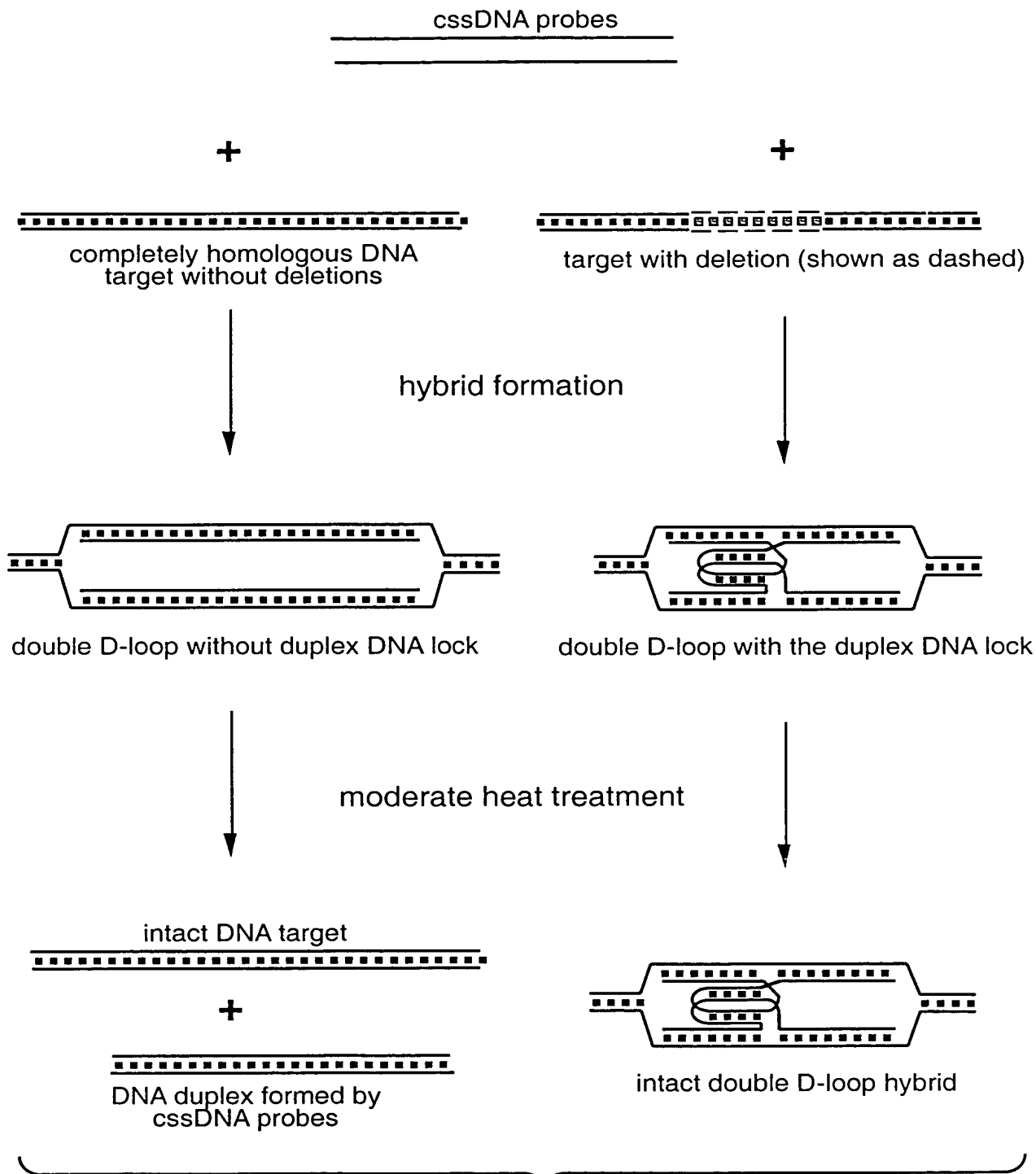


**FIG. 3**



Hybrid recognition by  
nucleic acid repair,  
nucleic acid recombination,  
and resolution enzymes

**FIG.\_4**

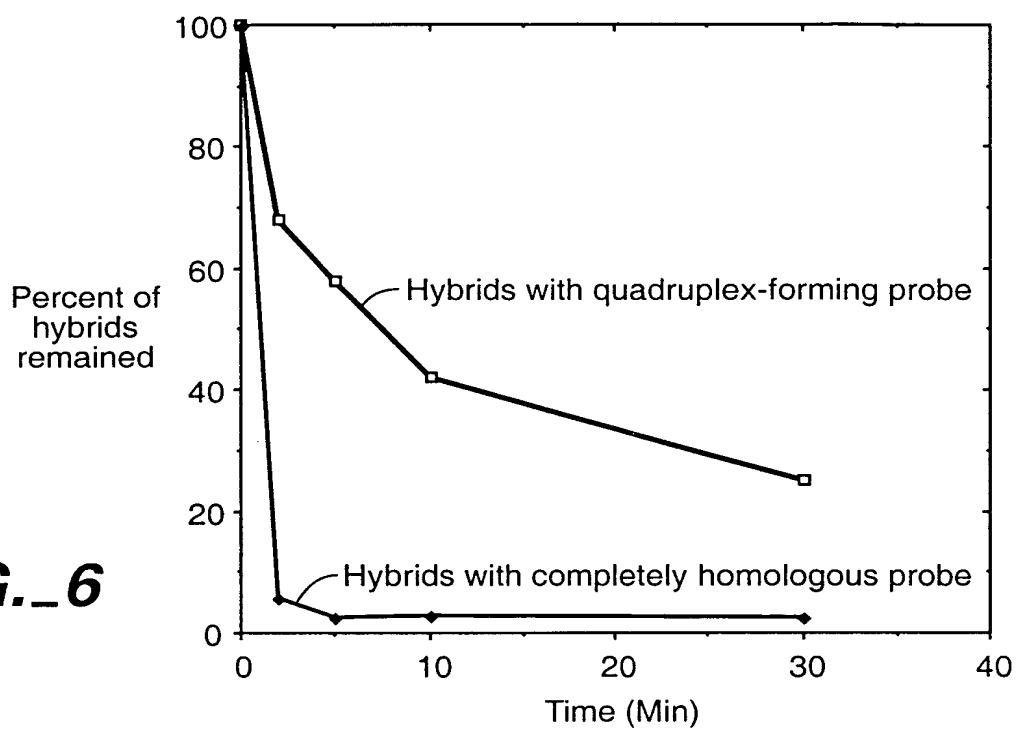


**FIG.\_5**

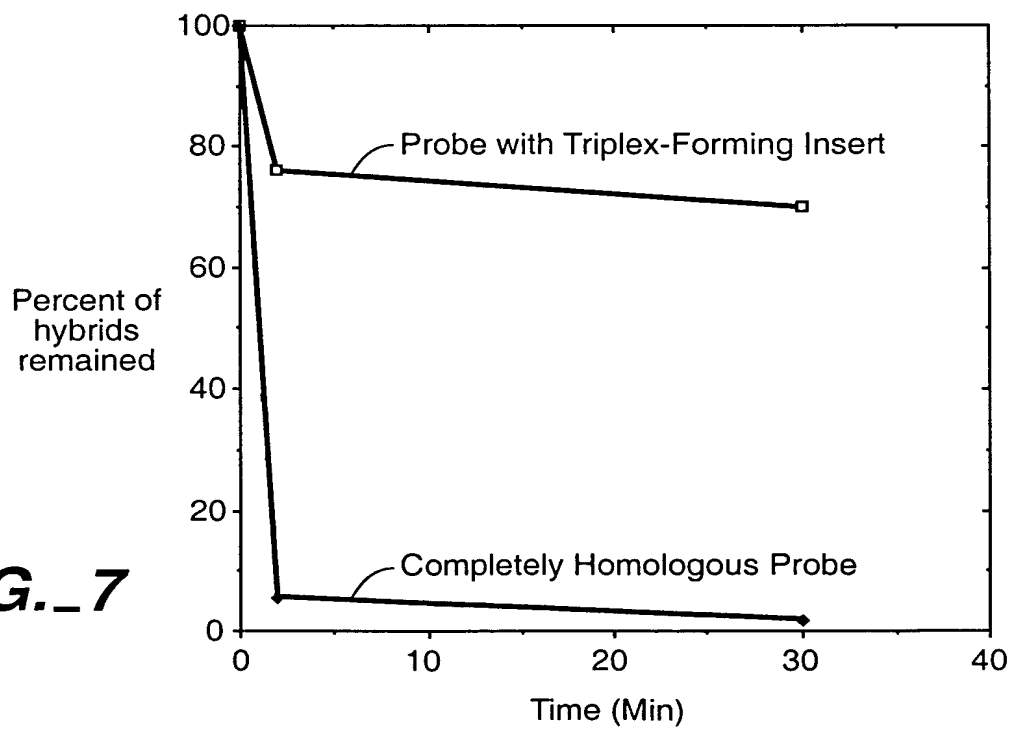


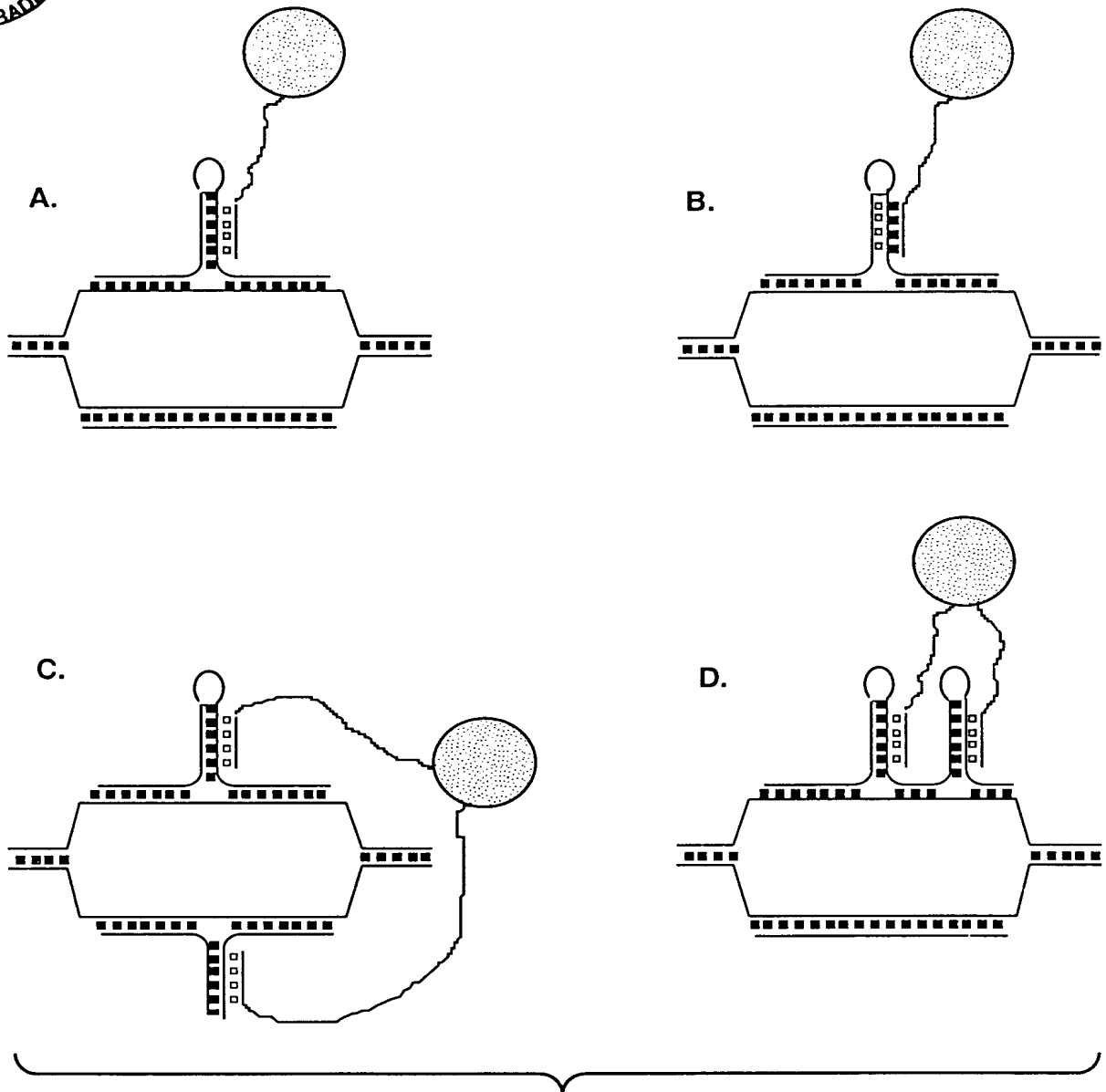
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**FIG.\_6**

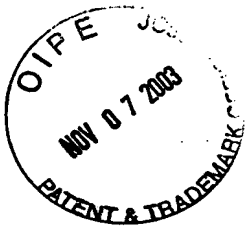


**FIG.\_7**

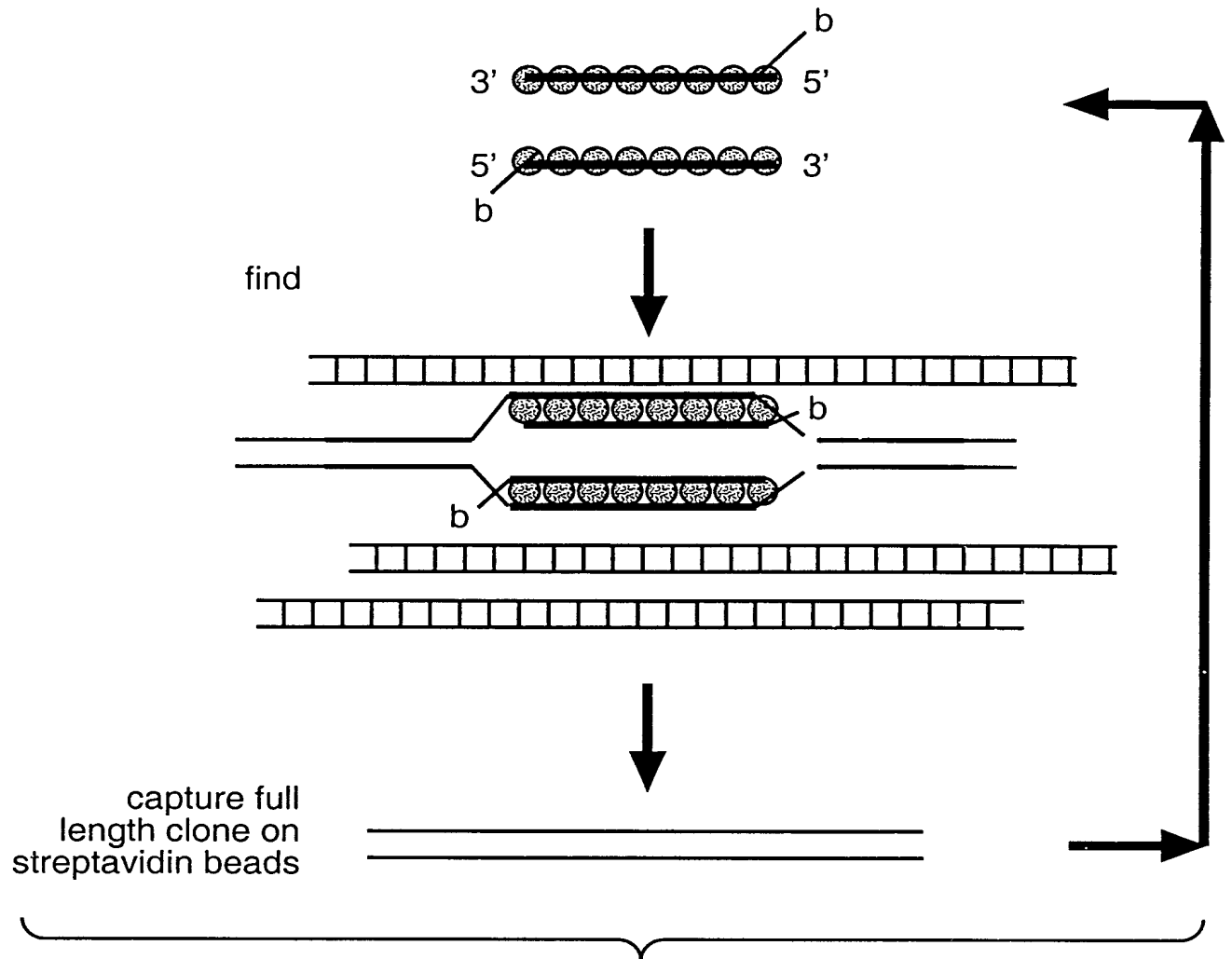




**FIG.\_8A**

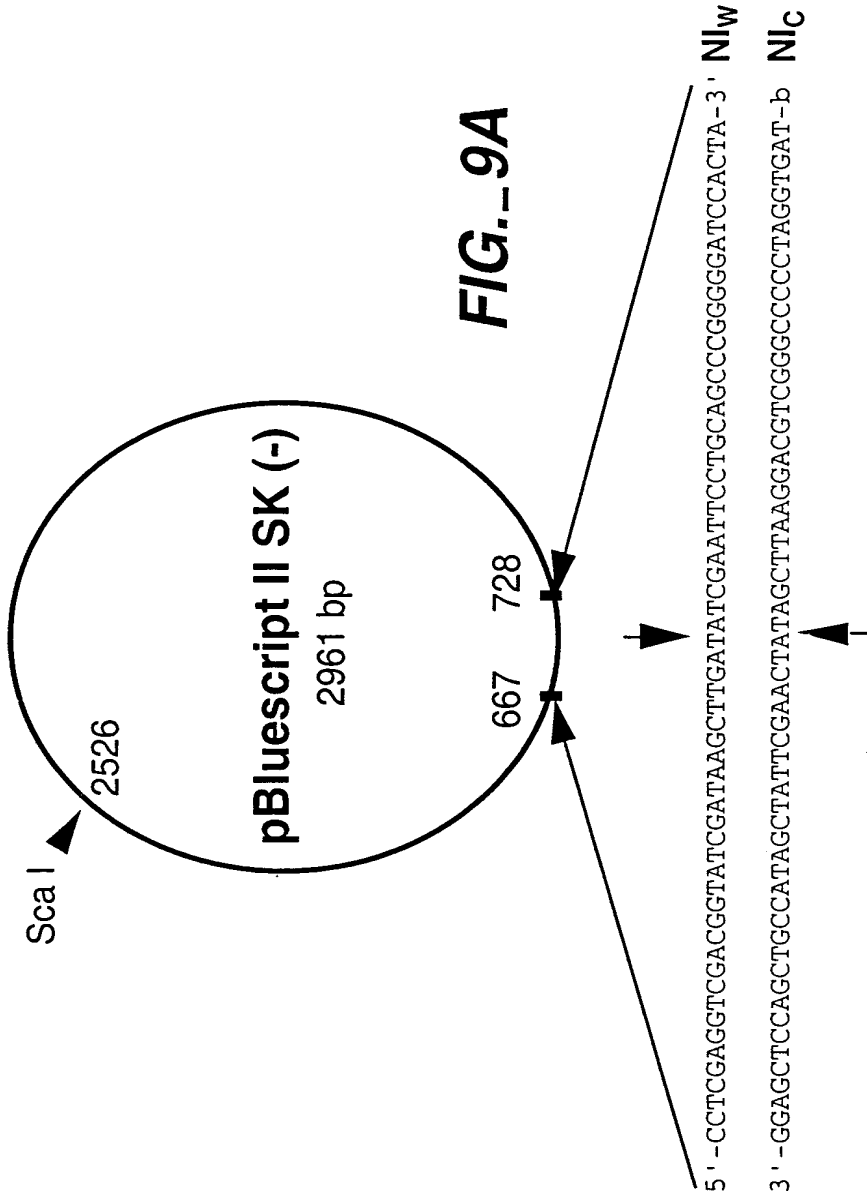


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**FIG. 8B**



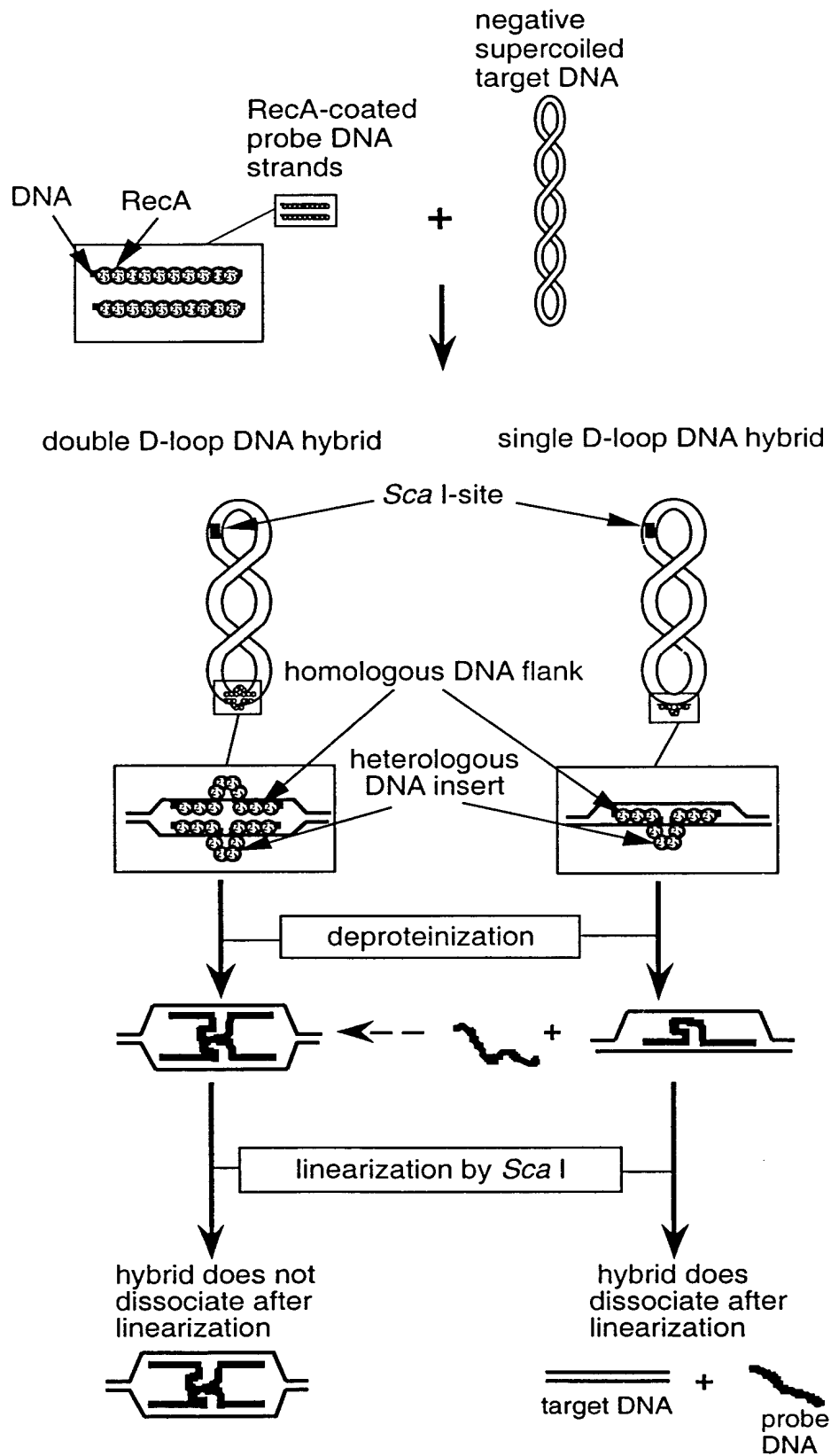


5'-CCTCGAGGTCGACGGTATCGATAAGCTTGAT**TGTGTGTGTGTGTGT**ATCGAATTCCTGCAGCCCCGGGGGATCCACTA-3' **ZIW**  
3'-GGAGCTCCAGCTGCCATAGCTATTTCGAACTA**ACACACACACACACACA**TAGCTTAAGGACGTCGGGCCCCCTAGGTGAT-b **ZIC**

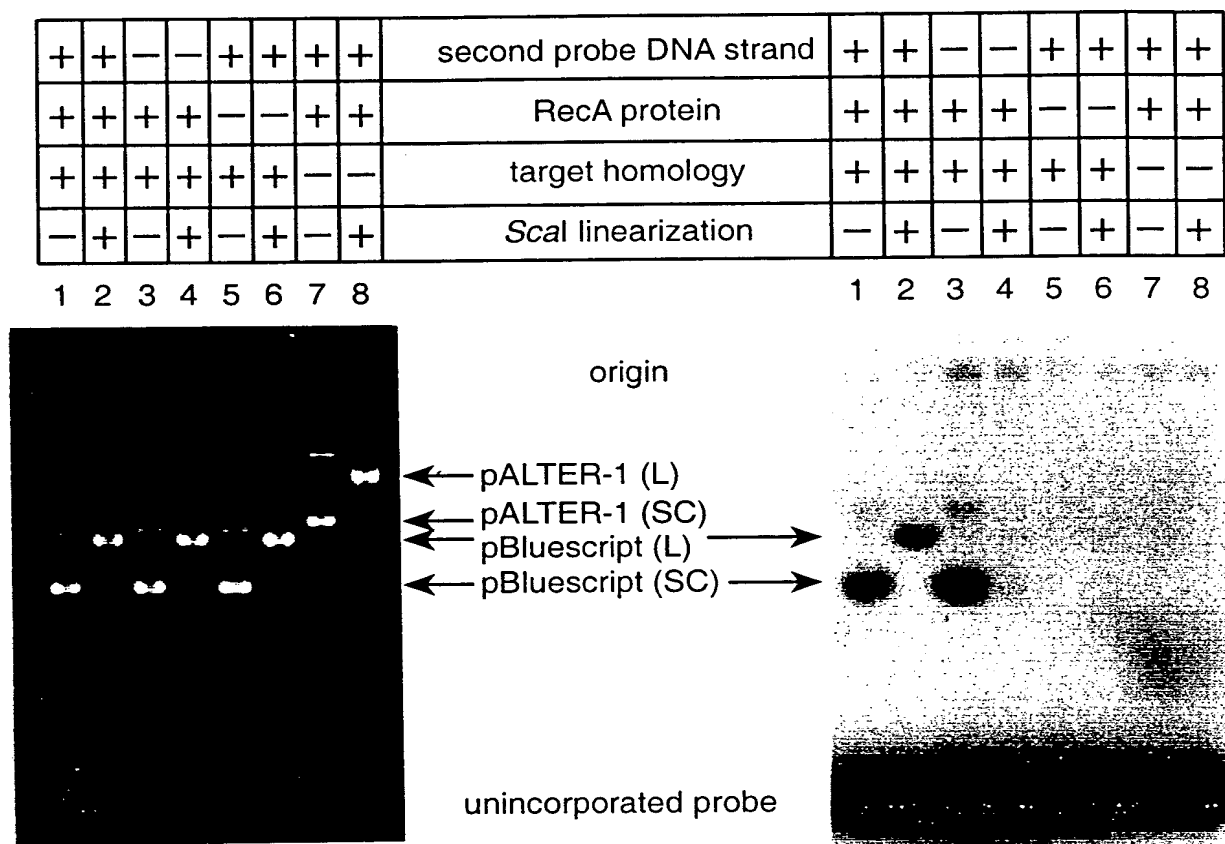
**FIG.\_9B**

5'-CCTCGAGGTCGACGGTATCGATAAGCTTGAT**TTGGGGTTGGGGTT**ATCGAATTCCTGCAGCCCCGGGGGATCCACTA-3' **QIW**  
3'-GGAGCTCCAGCTGCCATAGCTATTTCGAACTA**TTGGGGTTGGGGTT**TAGCTTAAGGACGTCGGGCCCCCTAGGTGAT-b **QIC**

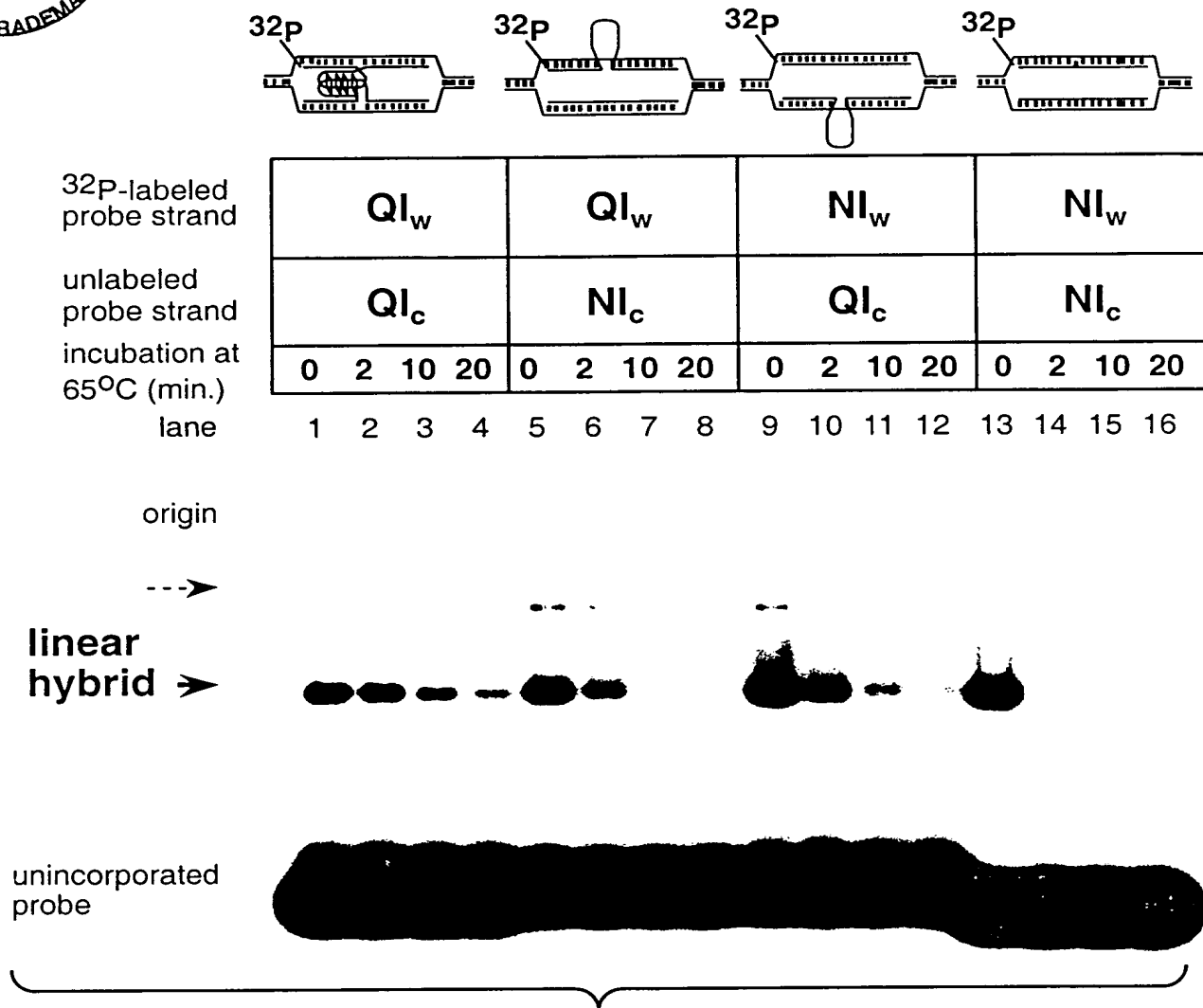
**FIG.\_9C**



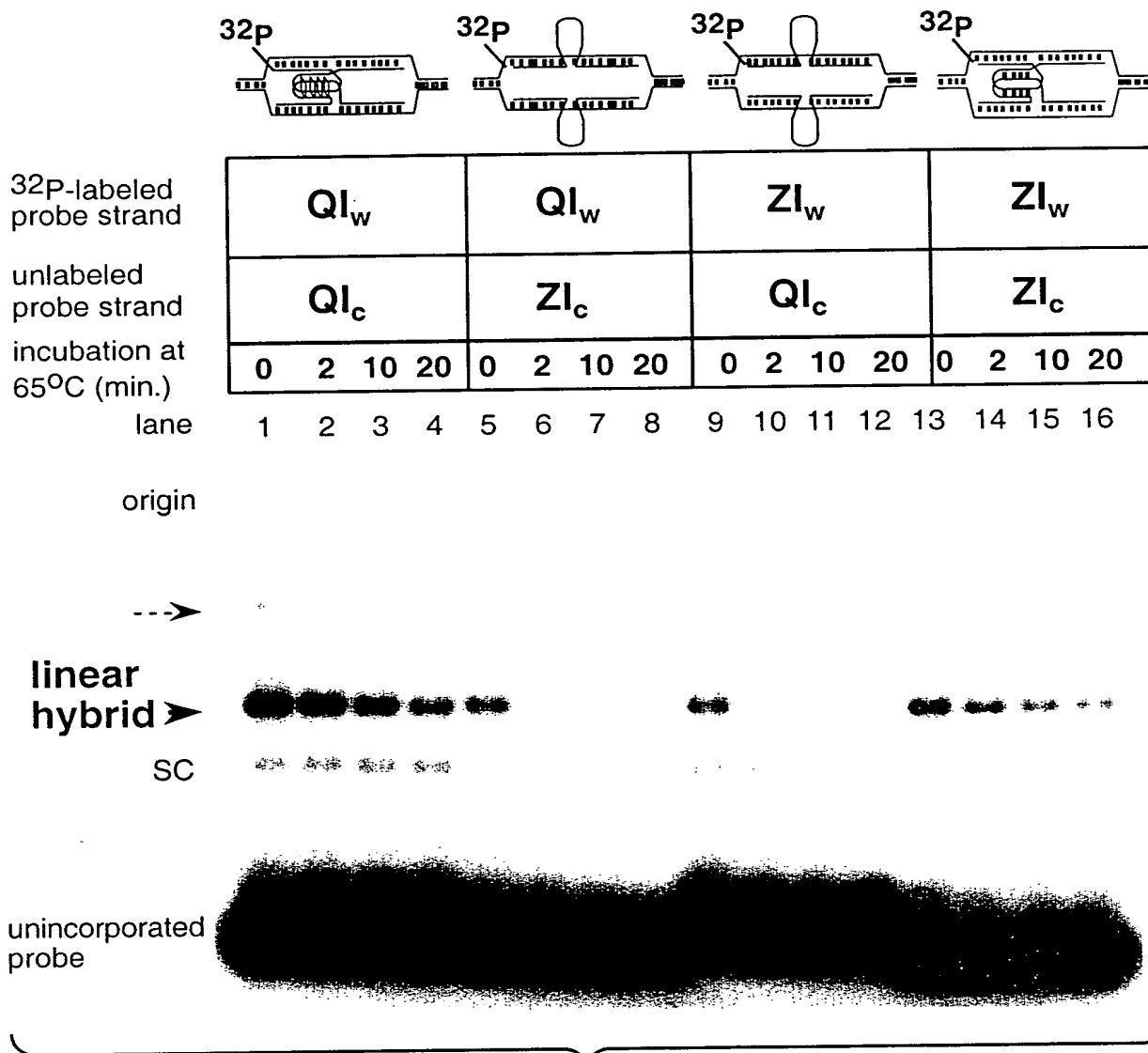
**FIG.\_10**



**FIG.\_11**



**FIG. 12A**



**FIG. 12B**



	top probe strand bottom probe strand				
			$NI_w$	$ZI_w$	$QI_w$
$NI_c$					
			$\tau_{1/2} < 2$	$\tau_{1/2} < 2$	$\tau_{1/2} < 2$
$ZI_c$					
			$\tau_{1/2} < 2$	$10 \leq \tau_{1/2} < 20$	$\tau_{1/2} < 2$
$QI_c$					
			$\tau_{1/2} < 2$	$\tau_{1/2} < 2$	$5 \leq \tau_{1/2} < 10$

**NI** = No DNA Insert

**ZI** = Z-DNA forming Insert

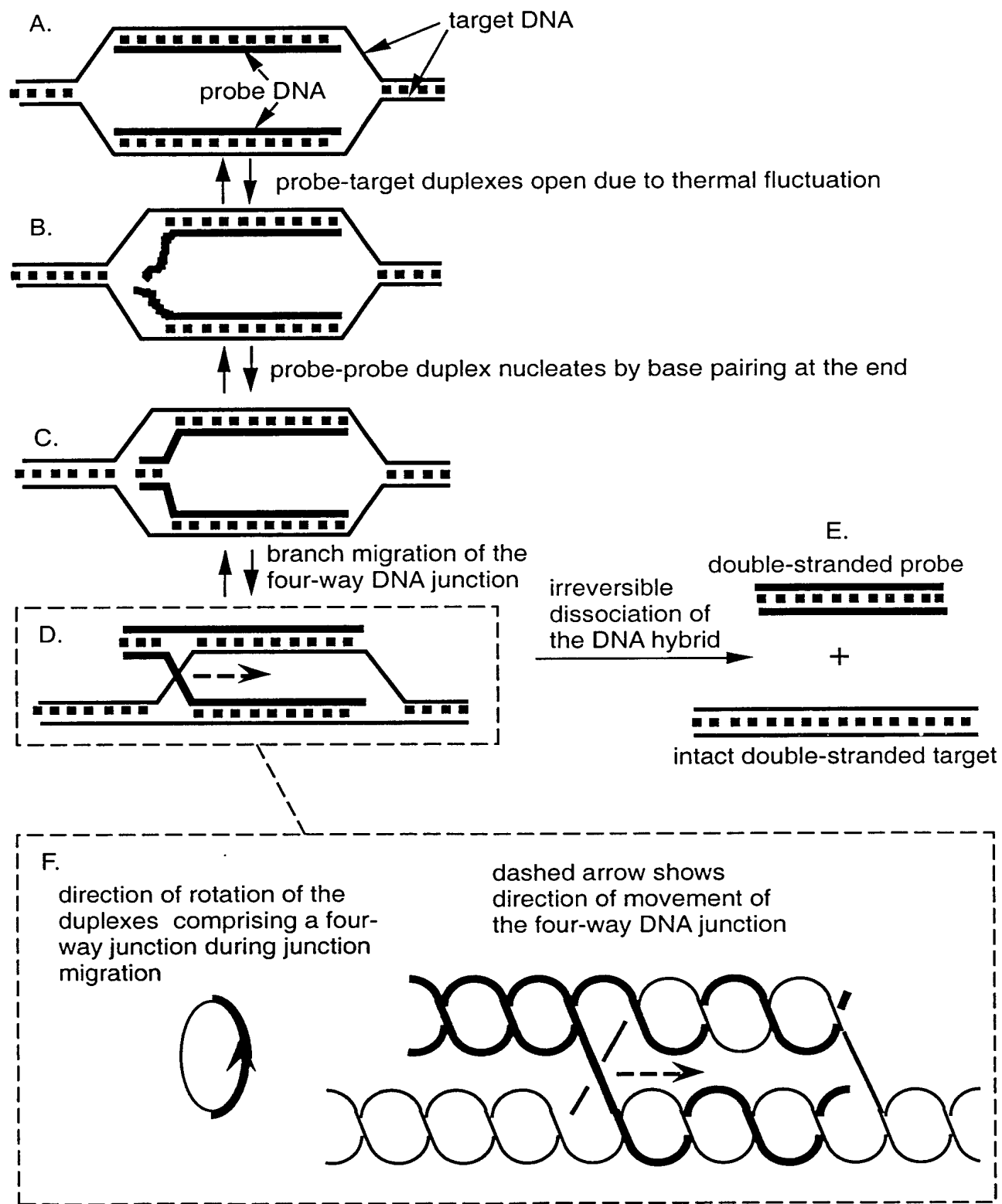
**QI** = Quadruplex-DNA forming Insert

**w** = Watson DNA strand

**c** = Crick DNA strand

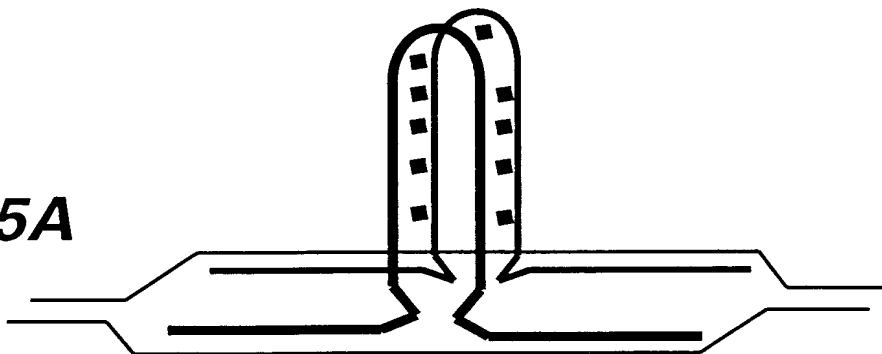
$\tau_{1/2}$  = double D-loop DNA hybrid apparent half-life time (min.)

**FIG. 13**

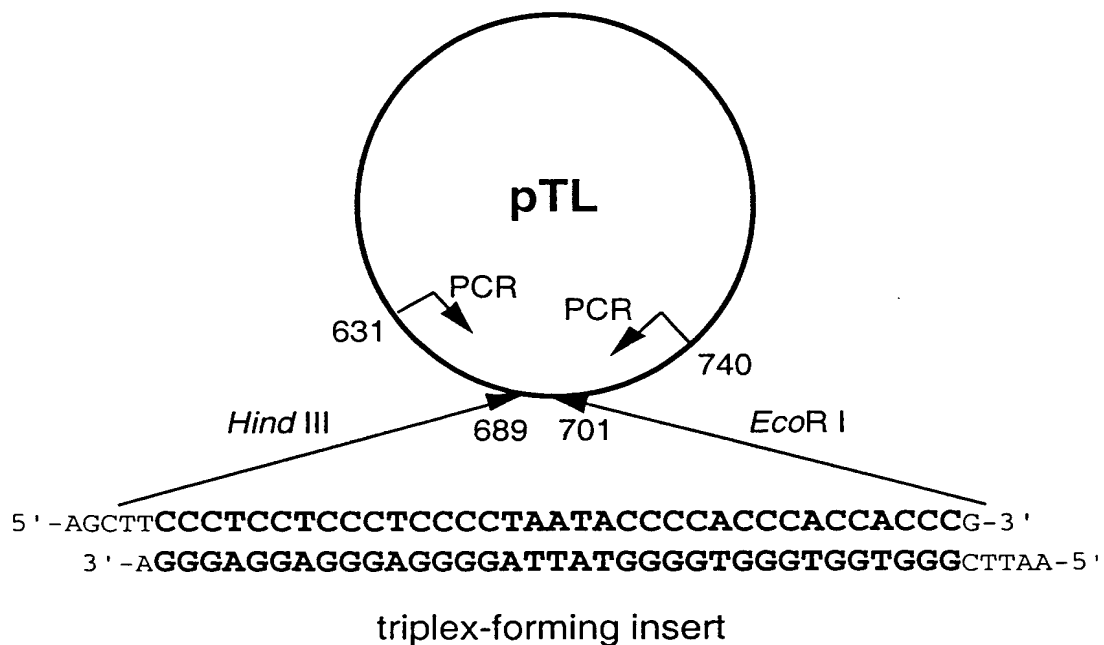
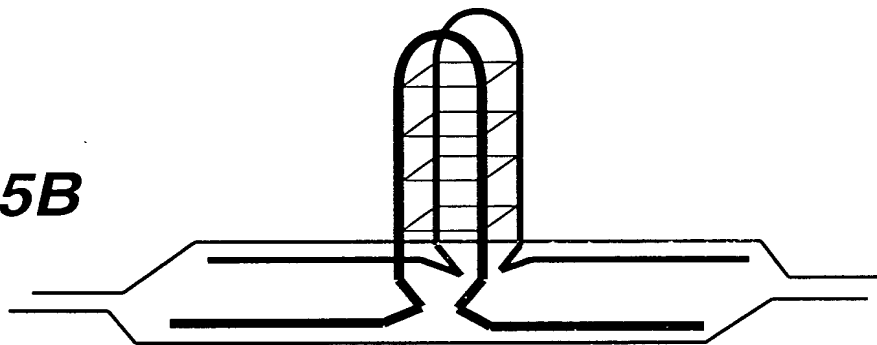


**FIG. 14**

**FIG.\_15A**

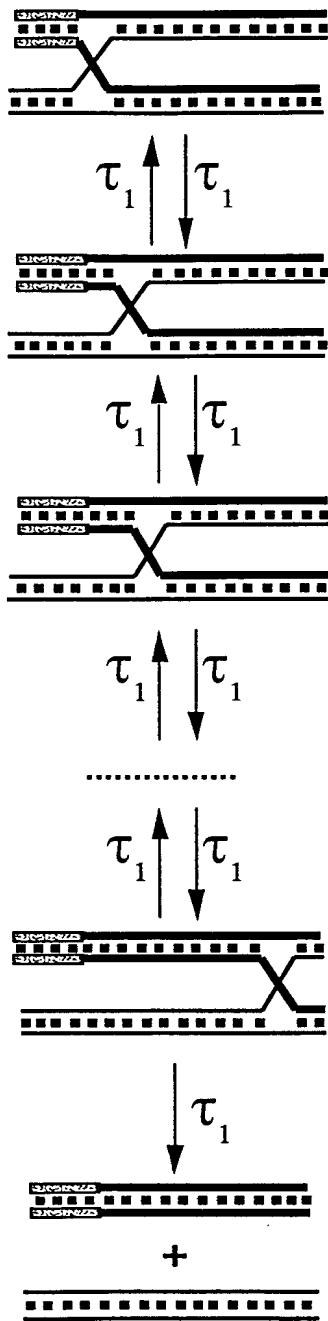


**FIG.\_15B**

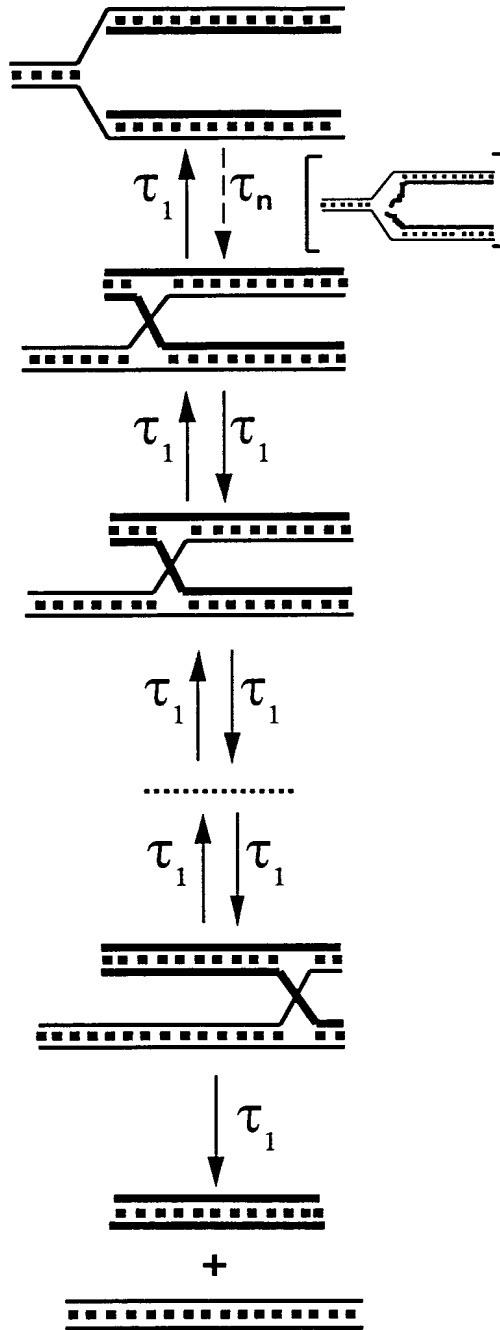


**FIG.\_16**

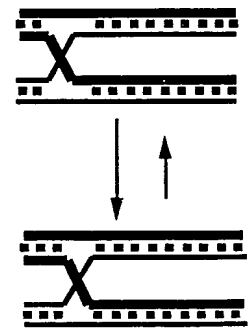




**FIG.\_17A**

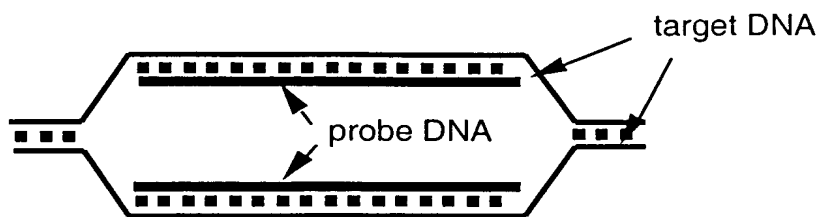


**FIG.\_17B**

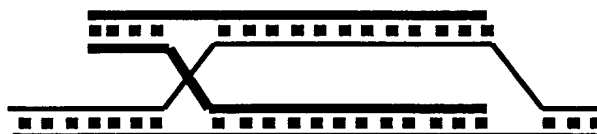


**FIG.\_17C**

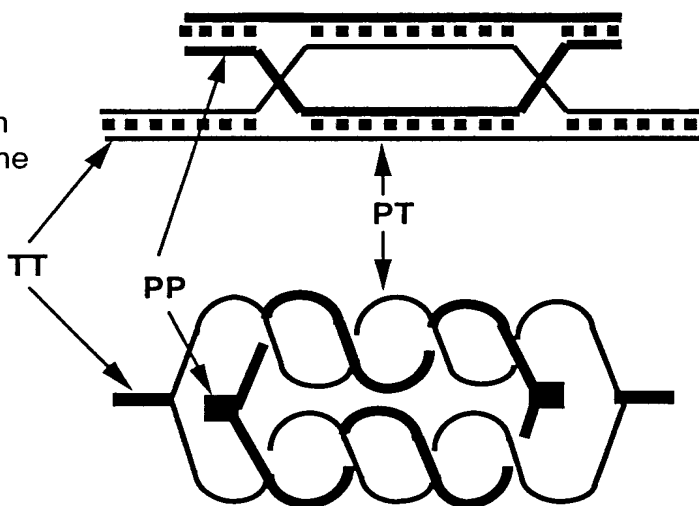
A: Double D-loop DNA without nucleation of the probe-probe duplex



B: Double D-loop DNA with single nucleation (sn) of the probe-probe duplex



C: Double D-loop DNA with double nucleation (dn) of the probe-probe duplex



TT = target-target DNA duplex

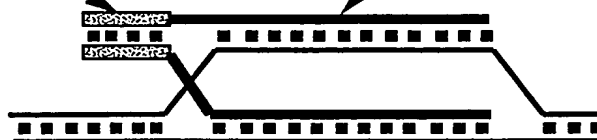
PP = probe-probe DNA duplex

PT = probe-target DNA duplex

probe DNA sequence  
heterologous to target DNA

probe DNA sequence  
homologous to target DNA

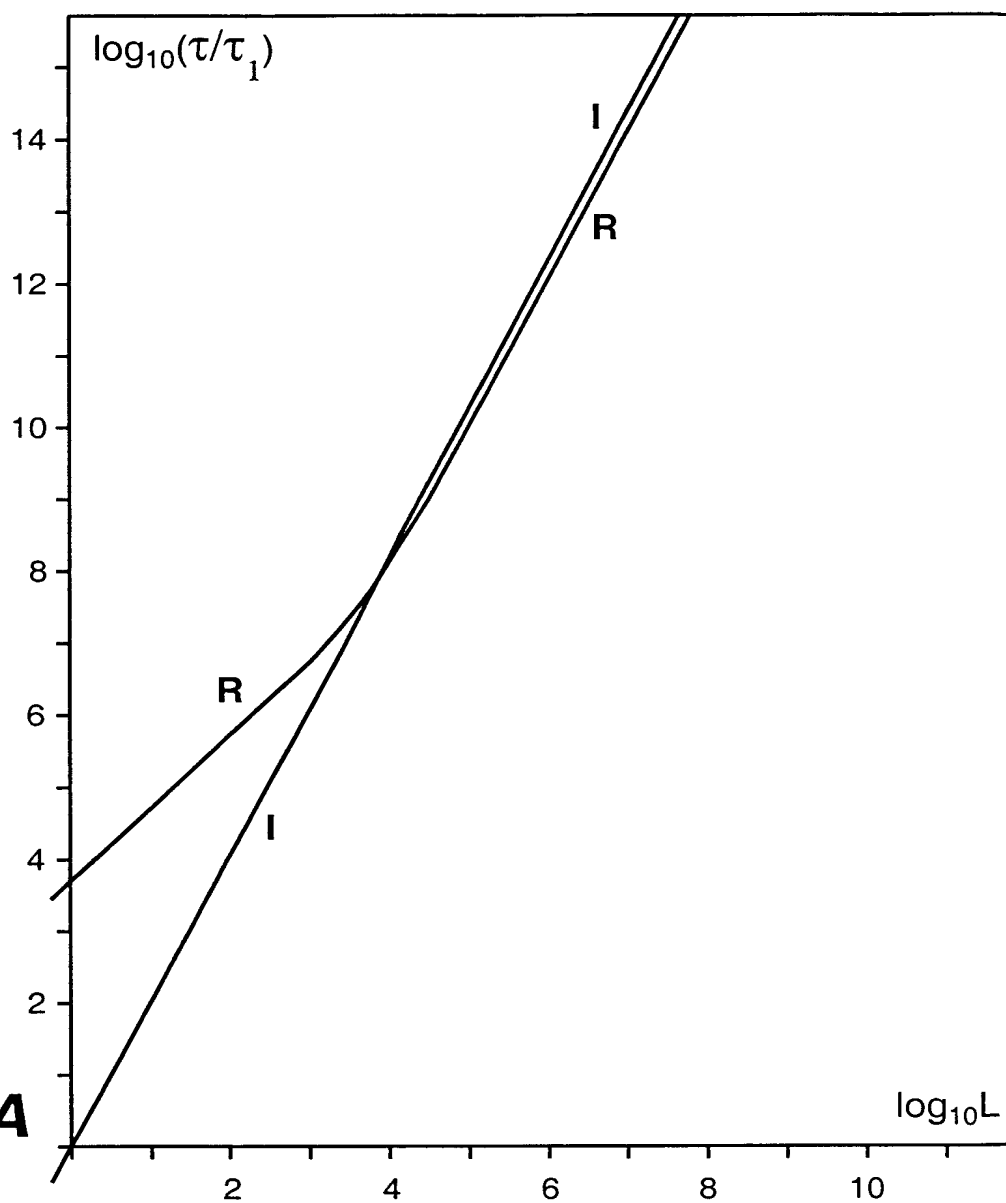
D: Double D-loop DNA with irreversible single nucleation of the probe-probe duplex at one end



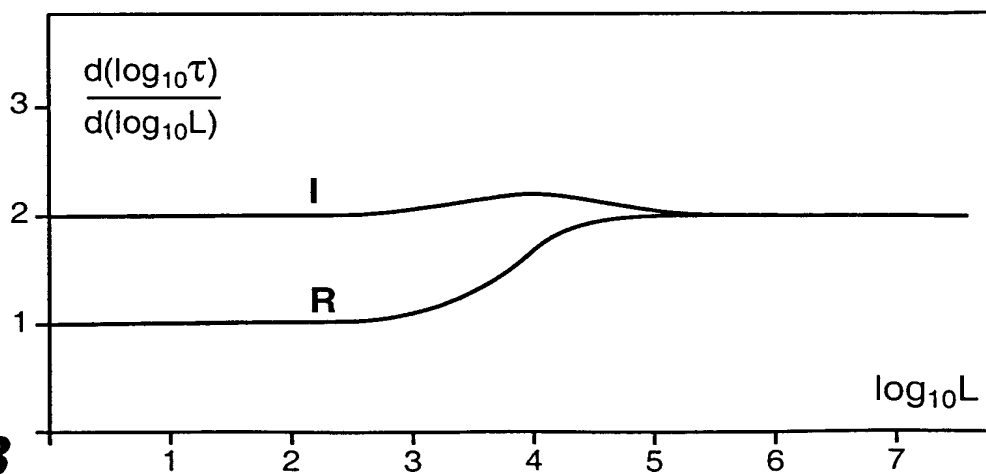
**FIG. 18**



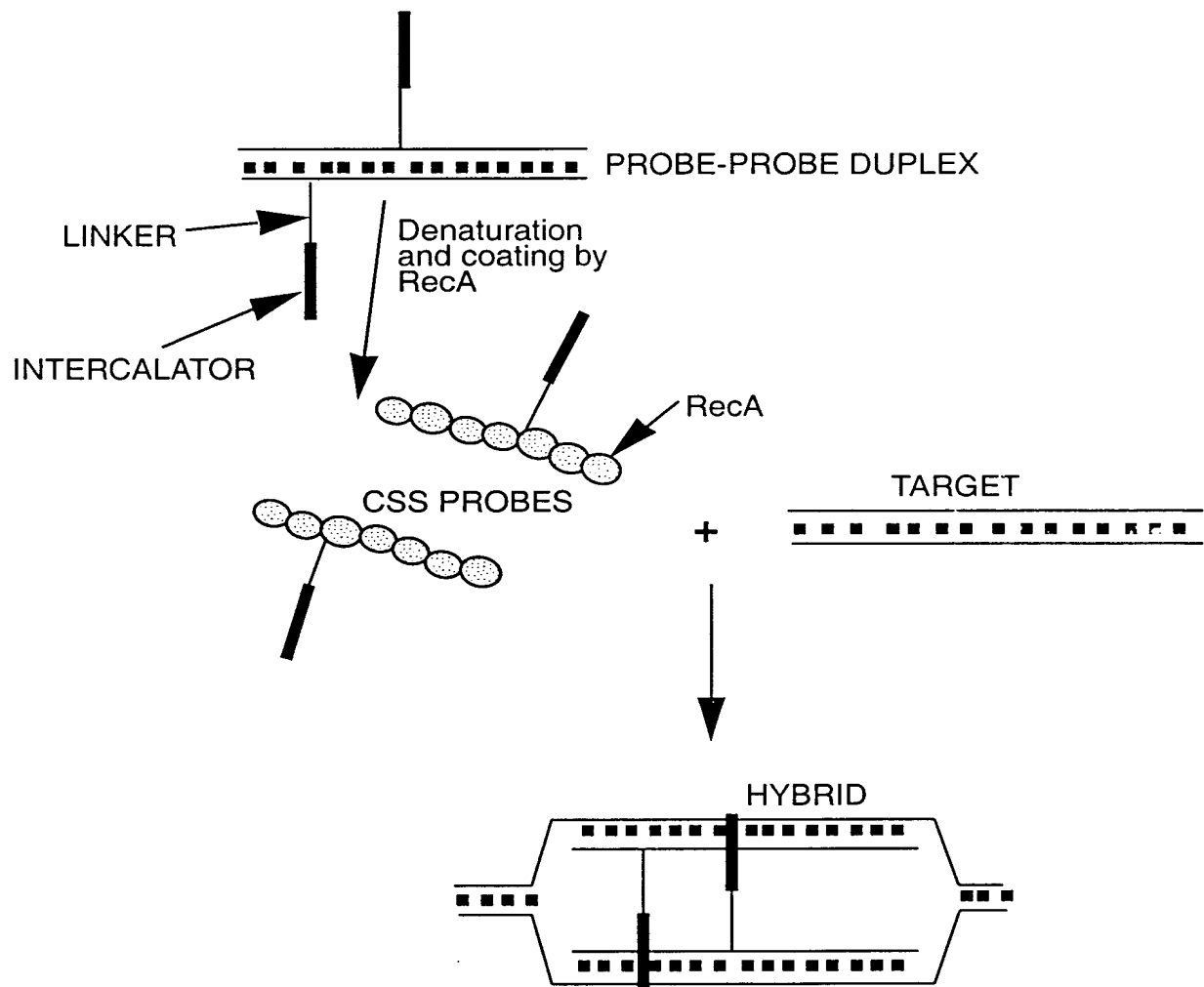
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**FIG.\_19A**



**FIG.\_19B**



**FIG.\_20**